

IN THE SPECIFICATION

Please replace the paragraph beginning on p. 7 with the following amended paragraph:

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and form part of the specification, illustrate the present invention and, together with the description, explain the invention. In the drawings like elements are referred to by like numbers.

Figures 1a-1c show sequential images of an injection at a right cross junction.

Figure 2 shows distribution of electric field lines at a right cross junction having channels with equal cross-sectional areas.

Figure 3 shows an embodiment of the invention.

Figure 4 shows a resistor network model of a right cross junction.

Figure 5 shows electric field lines where one segment of a channel in a right cross junction has a region of reduced cross-sectional area.

Figures 6a-6c shows sequential images of an injection at the junction of Fig. 5

Figures 7a and 7b show sequential images of the injection of a double "Y" junction having regions of reduced cross-sectional area proximate the junction.

Figure 8 shows a microchannel system.

Please replace the paragraph beginning on p. 10 with the following amended paragraph:

Referring again to Fig. 3, a section of each of microchannels 310 and 315 of length L, proximate the junction, has a Region of Reduced Effective Cross-sectional Area (hereinafter called a RORECA) as indicated by the shaded region produced by reducing the internal dimensions of the channel. ~~In the alternative,~~ As illustrated in FIG. 8,

reduction in effective cross-sectional area can be produced by filling ~~the~~ one of more channels with a material 330, such as a porous material, or ~~packing the channel with~~ or structured particles (porous or nonporous) fabricated by art recognized methods such as, lithographic patterning and etching to create arrays of structures in the microchannel or channels of varying dimension, by lithographic patterning and subsequent etching to create channels and then subsequent lithographic patterning and material deposition or regrowth to partially refill the channels, direct injection molding, *in-situ* polymerization, sol-gel processes, high energy lithography combined with electroforming and molding (LIGA), and hot or cold embossing. The depth (D) and width (W) of the intersection or junction is nominally, but not necessarily, the same as that of the channels away from the RORECA. Although in this example all intersecting channels are shown with a RORECA, it is not always necessary that all channels have a RORECA. Also, we note that the entire channel can be considered a RORECA if the effective area of the channel is less than the cross-sectional area of the intersection. The important point is that the area of the junction or intersection is larger than the reduced effective area of the intersecting channels at that junction. By narrowing only the area of the channel(s) in proximity to the intersection, the RORECA design has the additional advantage that the total resistance of the channel is only slightly affected, i.e., the total fluid flowrate through the channel is substantially the same